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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,640	01/22/2002	Seigo Shiraishi	10873.867US01	9430
23552	7590	03/29/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			AGUIRRECHEA, JAYDI A	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/055,640	SHIRAISHI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jaydi A. Aguirrechea	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 14-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 34 and 35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-13, 34 and 35 rejected under 35 U.S.C. 103(a) as being unpatentable over Safari et al. (US 5539965) in view of Slayton et al (US 5175709).

Safari et al. disclose a piezocomposite (Figures 1-7) comprising a plurality of composite sheet units (11, 13, 15, 19) including resin layers (32, 34, 36, 38) and a plurality of piezoelectric thin wires (42, 44, 46, 48) arranged in uniform direction on a surface of the resin layer.

However, Safari fails to disclose the structure wherein in each of the composite sheet units, the sintered piezoelectric thin wires are arranged on a surface of each resin layer so as to have void portions between adjacent ones of the sintered piezoelectric thin wires, and the plurality of composite sheet units are laminated and the laminated composite sheets are integrated.

Slayton discloses a piezocomposite structure wherein in each of the composite sheet units, the sintered piezoelectric thin wires are arranged on a surface of each resin layer so as to have void portions between adjacent ones of the sintered piezoelectric thin wires, and the plurality of composite sheet units are laminated and the laminated composite sheets are integrated. Slayton discloses that the spaces between the piezoelectric materials could be filled with ultrasonic suppression materials such as air, fiberglass or an electrically insulating epoxy or a combination of these materials (Column 1, lines 54-57). These layers are laminated and integrated. Therefore, it would have been obvious at the time of the invention was made to use

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the resin layer having void portions adjacent to the piezoelectric wires for the purpose of reducing undesirable cross coupling by providing a composite core (Column 1) as taught by Slayton.

3. With regards to claim 2, Safari discloses two layers of resin layers (32, 34).
4. With regards to claim 3, Safari discloses a filler material between the piezoelectric wires.
5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Safari.

Safari discloses the claimed invention except for the resin layer is composed of a plurality of constituent resin layers. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use two layers of resin, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 PSQ 8.

6. With regards to claims 5-9, Safari discloses the possibility of having different shapes (Column 5, lines 16-26) and effective thickness between 5 and 5000 microns.
7. With regards to claim 10, Safari discloses electrodes, where one of the could be grounded (Column 6, lines 1-10).
8. With regards to claim 11, the piezoelectric thin wires have cut surfaces in the lengthwise direction (Figures 6-7).
9. With regards to claims 12 and 13, Safari and Slayton discloses his invention as being directed to ultrasound transducers used in medical imaging with composite sheets laminated and integrated.
10. With regards to claim 34, the combination of Safari et al. (US 5539965) and Slayton et al (US 5175709) discloses the resin portions provided in the void portions

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11. With regards to claim 35, the combination of Safari et al. and Slayton discloses the claimed invention as disclosed above for claims 1, 12 and 13.

***Response to Arguments***

12. Applicant's arguments, see page 1, filed on 1/26/04, with respect to the rejection(s) of claim(s) 1, 12, 13 and 35 under USC 102 have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Safari et al. and Slayton.

***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

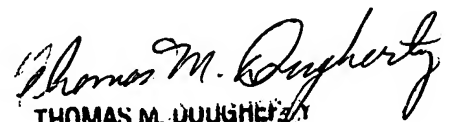
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaydi A. Aguirrechea whose telephone number is 571-272-2018. The examiner can normally be reached on M-Th 9-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren E. Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JAA  
3/22/04

  
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